

**IN THE CLAIMS**

Please amend claims 3, 4, 17, and 66, as shown below. Please add new claims 82-114. The following listing of claims replaces all prior listings.

1-2. (Canceled).

3. (Currently amended) A targeted vesicle composition according to Claim 17 wherein:

$X^1$  is  $C(=O)-NH$ ;

$R^1$  is acyl having from 16 to 20 carbons;

$R^3$  is a moiety having the structure  $(CH_2)_n$ , wherein n is an integer having has the value between 1 and 3; and

$R^4$  is acyl having from 16 to 20 carbons; and

$R^6$  is a direct bond.

4. (Currently amended) A targeted vesicle composition according to Claim 3 wherein:

$R^1$  is acyl having from 17 to 19 carbons;

$R^3$  is methylene n = 1; and

$R^4$  is acyl having from 17 to 19 carbons.

5.-11. (Canceled).

12. (Withdrawn) A targeted vesicle composition according to Claim 11, wherein:

Xaa is Glycine;

Yaa is Arginine;

Zaa is Serine;

n is 1, 2 or 3; and

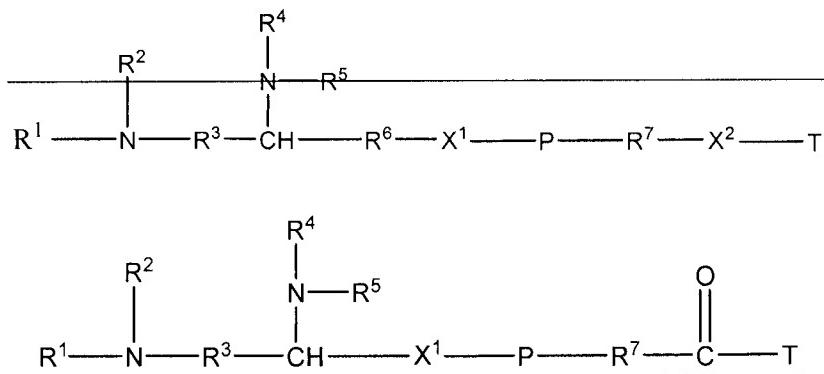
m is 1.

13. (Withdrawn) A targeted vesicle composition according to Claim 12, wherein:

n is 3.

14.-16. (Canceled).

17. (Currently amended) A targeted vesicle composition for therapeutic or diagnostic use *in vivo* comprising, in an aqueous carrier, gas filled liposomes comprising a phosphatidylcholine selected from the group consisting of dioleoylphosphatidylcholine, dimyristoylphosphatidylcholine, dipalmitoylphosphatidylcholine and distearoylphosphatidylcholine, wherein said liposomes further comprise a compound having the formula



(IV)

wherein:

X<sup>1</sup> is a group moiety selected from the group consisting of C(=X<sup>3</sup>), and C(=X<sup>3</sup>)-N(R<sup>8</sup>);

X<sup>2</sup> is C(=O);

X<sup>3</sup> is O or S;

R<sup>1</sup> acyl having from 16 to 23 carbons;

R<sup>2</sup> is hydrogen or lower alkyl;

R<sup>3</sup> is a moiety having the structure (CH<sub>2</sub>)<sub>n</sub>, wherein n is an integer having the value between 1 and 10;

R<sup>4</sup> is acyl having from 16 to 23 carbons;

R<sup>5</sup> is hydrogen or lower alkyl;

R<sup>6</sup> is a direct bond;

R<sup>7</sup> is (CH<sub>2</sub>)-(CH<sub>2</sub>) or a direct bond;

R<sup>8</sup> is hydrogen or lower alkyl;

P is PEG; and

T is a targeting ligand comprising a peptide having the sequence CRGDC, wherein the two cysteines are linked together via a disulfide linkage.

18.-21. (Canceled).

22. (Previously presented) A targeted vesicle composition according to Claim 17 wherein said phosphatidylcholine comprises dipalmitoylphosphatidylcholine.

23. (Previously presented) A targeted vesicle composition according to Claim 17 further comprising a phosphatidylethanolamine selected from the group consisting of dipalmitoyl-phosphatidylethanolamine, dioleoylphosphatidylethanolamine, N-succinyldioleoyl-phosphatidylethanolamine and 1-hexadecyl-2-palmitoylglycerophosphoethanolamine.

24. (Original) A targeted vesicle composition according to Claim 23 wherein said phosphatidylethanolamine comprises dipalmitoylphosphatidylethanolamine.

25. (Previously presented) A targeted vesicle composition according to Claim 17 further comprising dipalmitoylphosphatidic acid.

26. (Original) A targeted vesicle composition according to Claim 17, wherein said vesicles comprise a gas selected from the group consisting of perfluorocarbons and sulfur hexafluoride.

27. (Original) A targeted vesicle composition according to Claim 26 wherein said perfluorocarbon gas is selected from the group consisting of perfluoromethane, perfluoroethane, perfluoropropane, perfluorobutane and perfluorocyclobutane.

28. (Original) A targeted vesicle composition according to Claim 27 wherein said perfluorocarbon gas is selected from the group consisting of perfluoropropane and perfluorobutane.

29. (Original) A targeted vesicle composition according to Claim 28 wherein said perfluorocarbon gas comprises perfluorobutane.

30. (Original) A targeted vesicle composition according to Claim 17 wherein said gas is derived, at least in part, from a gaseous precursor.

31. (Original) A targeted vesicle composition according to Claim 30 wherein said gaseous precursor has a boiling point of greater than about 37°C.

32. (Original) A targeted vesicle composition according to Claim 31 wherein said gaseous precursor comprises a perfluorocarbon.

33. (Original) A targeted vesicle composition according to Claim 32 wherein said perfluorocarbon is selected from the group consisting of perfluoropentane and perfluorohexane.

34. (Original) A targeted vesicle composition according to Claim 17 wherein said vesicles further comprise a bioactive agent that is different from said gas and said compound.

35. (Original) A targeted vesicle composition according to Claim 34 wherein said bioactive agent comprises a therapeutic agent selected from the group consisting of genetic material, dihydroergotamine, heparin sulfate, tissue plasminogen activator, streptokinase, urokinase, hirudin, and mixtures thereof.

36-60. (Canceled).

61. (Previously presented) A targeted vesicle composition according to Claim 4 wherein:

each of R<sup>1</sup> and R<sup>4</sup> is acyl of 18 carbons.

62. (Canceled).

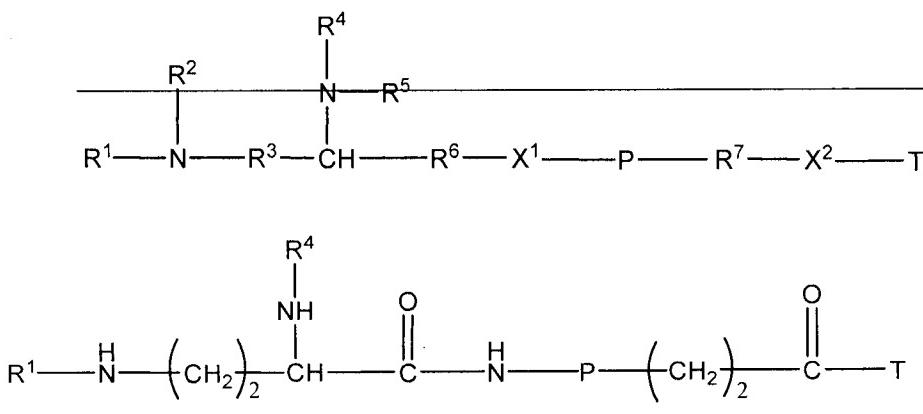
63. (Previously presented) A targeted vesicle composition according to Claim 4 wherein:

R<sup>1</sup> is an acyl of 18 carbons.

64. (Previously presented) A targeted vesicle composition according to Claim 17, wherein said targeting ligand T is a peptide having from 3 to 20 amino acids.

65. (Previously presented) A targeted vesicle composition according to Claim 64, wherein said peptide is cyclized by a linkage selected from the group consisting of sidechain to-sidechain covalent linkages, end-to-sidechain covalent linkages, and end-to-end covalent linkages.

66. (Currently amended) A targeted vesicle composition for therapeutic or diagnostic use *in vivo* comprising, in an aqueous carrier, gas filled liposomes comprising a phosphatidylcholine selected from the group consisting of dioleoylphosphatidylcholine, dimyristoylphosphatidylcholine, dipalmitoylphosphatidylcholine and distearoylphosphatidylcholine, wherein said liposomes further comprise a compound having the formula



wherein:

X<sup>1</sup> is C(=O)-N(R<sup>8</sup>);

X<sup>2</sup> is C(=O);

each of R<sup>1</sup> and R<sup>4</sup> is acyl having 18 carbons;

each of R<sup>2</sup>, R<sup>5</sup> and R<sup>8</sup> is H;

each of R<sup>3</sup> and R<sup>7</sup> is (CH<sub>2</sub>)<sub>2</sub>(CH<sub>2</sub>);

~~R<sup>6</sup> is a direct bond;~~

P is PEG-3400; and

T comprises a peptide having the sequence CRGDC, wherein the two cysteines are linked together via a disulfide linkage.

67. (Previously presented) The targeted vesicle composition according to Claim 81, wherein said bioactive agent is urokinase.

68. (Previously presented) The targeted vesicle composition according to Claim 66, wherein said phosphatidylcholine comprises dipalmitoylphosphatidylcholine.

69. (Previously presented) The targeted vesicle composition according to Claim 66, further comprising a phosphatidylethanolamine selected from the group consisting of dipalmitoyl-phosphatidylethanolamine, dioleoylphosphatidylethanolamine, N-succinyldioleoyl-phosphatidylethanolamine and 1-hexadecyl-2-palmitoylglycerophosphoethanolamine.

70. (Previously presented) The targeted vesicle composition according to Claim 69, wherein said phosphatidylethanolamine comprises dipalmitoylphosphatidylethanolamine.

71. (Previously presented) The targeted vesicle composition according to Claim 66, further comprising dipalmitoylphosphatidic acid.

72. (Previously presented) The targeted vesicle composition according to Claim 66, wherein said vesicles comprise a gas selected from the group consisting of perfluorocarbons and sulfur hexafluoride.

73. (Previously presented) The targeted vesicle composition according to Claim 72, wherein said perfluorocarbon gas is selected from the group consisting of

perfluoromethane, perfluoroethane, perfluoropropane, perfluorobutane and perfluorocyclobutane.

74. (Previously presented) The targeted vesicle composition according to Claim 73, wherein said perfluorocarbon gas is selected from the group consisting of perfluoropropane and perfluorobutane.

75. (Previously presented) The targeted vesicle composition according to Claim 74, wherein said perfluorocarbon gas comprises perfluorobutane.

76. (Previously presented) The targeted vesicle composition according to Claim 66, wherein said gas is derived, at least in part, from a gaseous precursor.

77. (Previously presented) The targeted vesicle composition according to Claim 76, wherein said gaseous precursor has a boiling point of greater than about 37°C.

78. (Previously presented) The targeted vesicle composition according to Claim 76, wherein said gaseous precursor comprises a perfluorocarbon.

79. (Previously presented) The targeted vesicle composition according to Claim 78, wherein said perfluorocarbon is selected from the group consisting of perfluoropentane and perfluorohexane.

80. (Previously presented) The targeted vesicle composition according to Claim 66, wherein said vesicles further comprise a bioactive agent that is different from said gas and said compound.

81. (Previously presented) The targeted vesicle composition according to Claim 80, wherein said bioactive agent comprises a therapeutic agent selected from the group consisting of genetic material, dihydroergotamine, heparin sulfate, tissue plasminogen activator, streptokinase, urokinase, hirudin, and mixtures thereof.

82. (New) A targeted vesicle composition according to claim 17, wherein X<sup>1</sup> is C(=X<sup>3</sup>).

83. (New) A targeted vesicle composition according to Claim 82, wherein said phosphatidylcholine comprises dipalmitoylphosphatidylcholine.

84. (New) A targeted vesicle composition according to Claim 82, further comprising a phosphatidylethanolamine selected from the group consisting of dipalmitoyl-phosphatidylethanolamine, dioleoylphosphatidylethanolamine, N-succinyldioleoyl-phosphatidylethanolamine and 1-hexadecyl-2-palmitoylglycerophosphoethanolamine.

85. (New) A targeted vesicle composition according to Claim 84, wherein said phosphatidylethanolamine comprises dipalmitoylphosphatidylethanolamine.

86. (New) A targeted vesicle composition according to Claim 82, further comprising dipalmitoylphosphatidic acid.

87. (New) A targeted vesicle composition according to Claim 82, wherein said vesicles comprise a gas selected from the group consisting of perfluorocarbons and sulfur hexafluoride.

88. (New) A targeted vesicle composition according to Claim 87, wherein said perfluorocarbon gas is selected from the group consisting of perfluoromethane, perfluoroethane, perfluoropropane, perfluorobutane and perfluorocyclobutane.

89. (New) A targeted vesicle composition according to Claim 88, wherein said perfluorocarbon gas is selected from the group consisting of perfluoropropane and perfluorobutane.

90. (New) A targeted vesicle composition according to Claim 89, wherein said perfluorocarbon gas comprises perfluorobutane.

91. (New) A targeted vesicle composition according to Claim 82, wherein said gas is derived, at least in part, from a gaseous precursor.

92. (New) A targeted vesicle composition according to Claim 91, wherein said gaseous precursor has a boiling point of greater than about 37°C.

93. (New) A targeted vesicle composition according to Claim 92, wherein said gaseous precursor comprises a perfluorocarbon.

94. (New) A targeted vesicle composition according to Claim 93, wherein said perfluorocarbon is selected from the group consisting of perfluoropentane and perfluorohexane.

95. (New) A targeted vesicle composition according to Claim 82, wherein said vesicles further comprise a bioactive agent that is different from said gas and said compound.

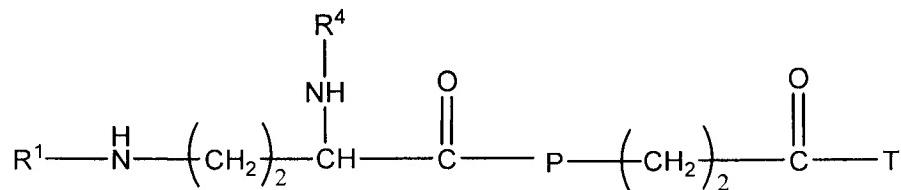
96. (New) A targeted vesicle composition according to Claim 95, wherein said bioactive agent comprises a therapeutic agent selected from the group consisting of genetic material, dihydroergotamine, heparin sulfate, tissue plasminogen activator, streptokinase, urokinase, hirudin, and mixtures thereof.

97. (New) A targeted vesicle composition according to Claim 82, wherein said targeting ligand T is a peptide having from 3 to 20 amino acids.

98. (New) A targeted vesicle composition according to Claim 97, wherein said peptide is cyclized by a linkage selected from the group consisting of sidechain-to-sidechain covalent linkages, end-to-sidechain covalent linkages, and end-to-end covalent linkages.

99. (New) A targeted vesicle composition for therapeutic or diagnostic use *in vivo* comprising, in an aqueous carrier, gas filled liposomes comprising a

phosphatidylcholine selected from the group consisting of dioleoylphosphatidylcholine, dimyristoylphosphatidylcholine, dipalmitoylphosphatidylcholine and distearoylphosphatidylcholine, wherein said liposomes further comprise a compound having the formula



wherein:

each of  $R^1$  and  $R^4$  is acyl having 18 carbons;

$P$  is PEG-3400; and

$T$  comprises a peptide having the sequence CRGDC, wherein the two cysteines are linked together via a disulfide linkage.

100. (New) The targeted vesicle composition according to Claim 99, wherein said phosphatidylcholine comprises dipalmitoylphosphatidylcholine.

101. (New) The targeted vesicle composition according to Claim 99, further comprising a phosphatidylethanolamine selected from the group consisting of dipalmitoyl-phosphatidylethanolamine, dioleoylphosphatidylethanolamine, N-succinyldioleoyl-phosphatidylethanolamine and 1-hexadecyl-2-palmitoylglycerophosphoethanolamine.

102. (New) The targeted vesicle composition according to Claim 101, wherein said phosphatidylethanolamine comprises dipalmitoylphosphatidylethanolamine.

103. (New) The targeted vesicle composition according to Claim 99, further comprising dipalmitoylphosphatidic acid.

104. (New) The targeted vesicle composition according to Claim 99, wherein said vesicles comprise a gas selected from the group consisting of perfluorocarbons and sulfur hexafluoride.

105. (New) The targeted vesicle composition according to Claim 104, wherein said perfluorocarbon gas is selected from the group consisting of perfluoromethane, perfluoroethane, perfluoropropane, perfluorobutane and perfluorocyclobutane.

106. (New) The targeted vesicle composition according to Claim 105, wherein said perfluorocarbon gas is selected from the group consisting of perfluoropropane and perfluorobutane.

107. (New) The targeted vesicle composition according to Claim 106, wherein said perfluorocarbon gas comprises perfluorobutane.

108. (New) The targeted vesicle composition according to Claim 99, wherein said gas is derived, at least in part, from a gaseous precursor.

109. (New) The targeted vesicle composition according to Claim 108, wherein said gaseous precursor has a boiling point of greater than about 37°C.

110. (New) The targeted vesicle composition according to Claim 108, wherein said gaseous precursor comprises a perfluorocarbon.

111. (New) The targeted vesicle composition according to Claim 110, wherein said perfluorocarbon is selected from the group consisting of perfluoropentane and perfluorohexane.

112. (New) The targeted vesicle composition according to Claim 99, wherein said vesicles further comprise a bioactive agent that is different from said gas and said compound.

113. (New) The targeted vesicle composition according to Claim 112, wherein said bioactive agent comprises a therapeutic agent selected from the group consisting of genetic material, dihydroergotamine, heparin sulfate, tissue plasminogen activator, streptokinase, urokinase, hirudin, and mixtures thereof.

114. (New) The targeted vesicle composition according to Claim 113, wherein said bioactive agent is urokinase.